

ANNUAL REPORT

1962

TOWN OF PORT COLBORNE

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ANNUAL REPORT

1962

ON THE

TOWN OF PORT COLBORNE

WATER POLLUTION CONTROL SYSTEM

OWRC PROJECT 59-S-47

and

OWRC PROJECT 60-S-73

TOWN OF PORT COLBORNE WATER POLLUTION CONTROL SYSTEM

OPERATED FOR

THE TOWN OF PORT COLBORNE

BY

THE ONTARIO WATER RESOURCES COMMISSION

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I HISTORY

During 1961 meetings were held between the Ontario Water Resources Commission and the Town of Port Colborne to discuss the operation of the existing sewage system which comprised the Killaly Street and King Street plants and seven pumping stations. On June 1, 1961 at the request of the Town, the Division of Plant Operations of the OWRC took over the operation of the above mentioned works. Four members of the town staff were transferred to the OWRC staff at this time.

During 1961 the new West Side Activated Sludge Treatment Plant (Project 59-S-47) was being constructed by the OWRC on the site of the old King Street Plant. The new plant was placed into operation in November 1961 and the existing old plant was demolished. The plant was officially opened on July 25, 1962.

The new plant was designed by Canadian-British Engineering Consultants, Toronto and the general contractor was Frid Construction Company Limited.

At the end of the year 1962 the Clarke Street pumping station came into operation. This station is part of Project 60-S-73 which also includes a forcemain to the Killaly Street plant and sanitary sewers.

The consulting engineers for Project 60-S-73 were Canadian-British Engineering Consultants and the general contractor was Dick Construction.

II PLANT DESIGN

A. WEST SIDE WATER POLLUTION CONTROL PLANT (KING ST.)

General

The plant is located at the intersection of King and Keefer Streets. It treats the sewage for the section of the Town on the west side of the Welland Ship Canal.

The sewage is pumped to the plant by four outlying pumping stations located at Ash Street, Elm Street, Sugar Loaf Street and near the Town Hall.

Influent Works

The waste water enters the plant via a 14 inch diameter inlet sewer, passing through one of two manually cleaned bar screens, into the grit channels.

The bar screens prevent large objects from entering the plant. In the grit channels the velocity of flow is reduced sufficiently to allow settling of the heavier particles of grit and detritus material which otherwise would damage the plant. These channels are operated alternately to allow cleaning of one while the other is in use.

From the grit channels the flow passes through a venturi flume, which measures the flow entering the plant, and into the primary distribution chamber.

Primary Settling

The two circular primary settling tanks receive the waste water from the distribution chamber, which proportionately distributes the flow equally between the two tanks.

These tanks provide a detention period to the flow and allow the heavier organic material (sludge) to settle for removal. The tanks are equipped with sludge and surface scum removal mechanisms which draw off the accumulated sludge and scum and pump it to the primary digester for treatment.

The partially settled flow then passes over the effluent weirs to the aeration tanks.

Aeration

The six aeration tanks provide the biological environment required to remove the finely divided, suspended and dissolved organic materials remaining in the flow.

The settled sludge (activated sludge), from the final settling tanks, is recirculated back to the aeration tanks and mixes with the effluent from the primary tanks. The mixed liquid (mixed liquor) is then aerated by the high intensity aerating cones which supply, by their agitating action, the oxygen requirements of the biological communities of aerobic micro-organisms (sludge floc).

(The activated sludge which is returned, acts as the vehicle for the bacteria which in turn oxidizes the organic material).

The mixed liquor then passes into the final distribution chamber.

Final Settling

The two circular final settling tanks receive the flow from the distribution chamber and provide another detention period to the mixed liquor, for removal of the activated sludge. The

tanks are equipped with sludge removal facilities which draw off the activated sludge and return it to the aeration tanks or to waste.

The clarified effluent is then discharged over the effluent weirs to the chlorine contact chamber.

Chlorination

The chlorine contact chamber provides another short detention period to ensure overall contact with the chlorine, which is piped in from an automatic proportional chlorinator. The chlorine disinfects the effluent by destroying any remaining bacteria.

The effluent is then discharged to the Welland Canal.

Digestion

The digestion in this plant is performed in two stages; called primary and secondary digestion.

The sludge from the primary settling tanks along with waste activated sludge, is pumped to the primary digester. In the absence of air, and at a temperature of 90 degrees Fahrenheit, the decomposing or digestion process begins. The sludge is broken down by a bacterial action to a thick, black, odourless liquid. Constant agitation ensures overall treatment.

The secondary digester receives the digested sludge and completes the process. This digester is not agitated but is left in a quiescent state. The supernatant is decanted and returned to the treatment process and the settled digested sludge is pumped out

and trucked away for disposal.

During the digestion process, sludge gas (principally methane) is formed and is used as a fuel for the boiler, supplying heat to the buildings and digesters. Standby fuel is oil.

DESIGN DATA

General

- a) Type of plant - activated sludge process.
- b) Design Population - 9,000 persons.
- c) Per Capita Flow - 100 gal/capita/day.
- d) Design plant flow - (Dry weather flow 900,000 gal/day D.W.F.
combined flow 3,600,000 gal/day
4 D.W.F.)
- e) 5 day BOD of raw sewage - 225 ppm, Removal - 93%
- f) Suspended solids of raw sewage - 300 ppm, Removal - 93%

Influent Sewer - 14 inch diameter

Screens

Located before the grit channels and manually cleaned.

14 - 1" spaces) 2 sets
15 - 1/2" bars	

Grit Channels

2 parallel units
Length - 40' - 4"
Width - 1' - 10"
Cross-Sectional area 1.67 sq. ft.
Volume - 67.3 cu.ft. = 419 gallons
Detention at design flow (D.W.F.) - 0.67 minutes
Velocity 1 ft./sec.
A grit trough is provided which discharges to a wheelbarrow.

Primary Clarifiers

2 units, circular
Size - 50'Ø x 9' liquid depth
Volume (2 units) - 35,300 cu.ft. = 220,000 gals.
Detention at design flow 5.87 hours
Surface settling rate - 229 gal/sq.ft. of tank/day
Weir overflow rate - 2860 gal/lin.ft. of weir/day
Equipment - Dorr-Oliver-Long Limited

Raw Sludge Pumps

- 2 - Carter plunger type 75 gpm at a T.D.H. of 30 feet
and driven by 3 HP General Electric motors.

Aeration Section

Type - surface aeration
6 units, square
Size of each unit 30' x 30' x 10.5' (Normal W.L.)
Volume (6 units) - 52,300 cu.ft. = 326,000 gal.
Detention at design flow = 8.7 hours
Detention at design flow = 6.7 hours (including 30%
return sludge)
BOD loading - 26 lbs. BOD/day/1,000 cu.ft. of aerator
(assuming 35% BOD reduction in the primary)
Equipment - Ames Crosta Mills Limited

Final Clarifiers

2 units, circular
Size 45' ϕ x 8' liquid depth
Volume (2 units) - 25,500 cu.ft. = 159,500 gals.
Detention at design flow 4.24 hours
Surface settling rate - 282 gal/sq.ft. of tank/day
Weir overflow rate - 3,200 gal/lin.ft. of weir/day
Equipment - Ames Crosta Mills Limited

Activated Sludge Pumps

- 3 - Ames Crosta pumps rated at 315 gpm at a T.D.H. of
30 feet and driven by 7.5 HP Brook Huddersfield motors.

Chlorine Contact Chamber

1 unit, rectangular
Volume - 16,060 cu.ft. = 100,000 gallons
Contact period at design flow - 16 minutes

Chlorinators

Storm flow chlorinator; Wallace and Tiernan series
A - 731, V-notch
Main flow chlorinator; Wallace and Tiernan series
A - 731, V-notch
Maximum capacity of each chlorinator is 400 lbs of
chlorine per day.

Digesters

2 units, 1 heated circular primary with floating cover and 1 unheated circular secondary.
Size of primary - 35'Ø x 22' depth
Volume of primary - 21,200 cu.ft.
Capacity of primary - 2.34 cu.ft./capita
Mixing of primary - Dorr draft tube mixer
Operating temperature - for the primary is 90°F.- 95°F. accomplished by a spiral heat exchanger capable of transferring 200,000 BTU per hour.
Size of secondary - 30'Ø x 19' depth
Volume of secondary - 13,400 cu.ft.
Capacity of secondary - 1.49 cu.ft./capita
Loading (2 units) - 2.18 lbs. of solids/cu.ft. of tank/month
Equipment - Dorr-Oliver-Long Limited

Heat Exchanger

1 number 25 spiral heat exchanger manufactured by Dorr-Oliver capable of transferring 200,000 BTU per hour from the hot water to the sludge.

Sludge Recirculating Pumps

2 - Wemco sludge recirculating pumps rated at 75 US gpm at a T.D.H. of 40 feet driven by 5 HP General Electric motors

Sludge Transfer Pump

1 Carter duplex plunger pump rated at 150 US gpm

Digester Mixer

1 Dorr-Oliver draft tube mixer located in the primary digester

Miscellaneous Equipment

Boiler-Cleaver-Brooks, rated at 500,000 BTU/hour, operating on digester gas with natural gas standby.

Boiler Water Recirculating Pump - Ingersoll, 40 US gpm at a T.D.H. of 32 feet driven by a $\frac{3}{4}$ HP Doerr Electric motor

Building Hot Water Circulating Pump - Armstrong, 1½-inch, driven by a 1/6 HP motor.

Froth Spray Pump - driven by a Westinghouse 10 HP motor.

Digester Building Sump Pump - 1 Smart Turner 20 gpm at a T.D.H. of 20 feet driven by a $\frac{1}{2}$ HP General Electric motor.

Administration Building Sump Pump - 1 Smart Turner 20 gpm at a T.D.H. of 20 feet driven by a $\frac{1}{2}$ HP General Electric motor.

Digester Gas Booster Pump - 1 Rootes-Connersville positive displacement pump driven by a $\frac{1}{2}$ HP General Electric motor

Flow Measurement

Main sewage flow
Sewage to aeration
Total activated sludge
Return activated sludge

B. EAST SIDE WATER POLLUTION CONTROL PLANT (KILLALY ST.)

General

The plant is located near the intersection of Killaly Street and Welland Street. It treats the sewage for the section of the Town located on the east side of the Welland Ship Canal.

The plant is fed by four outlying pumping stations, one at Fares Street, one at Nickel Street, one at Colborne Stand a new one at Clarke Street. The Colborne Street station will be taken out of operation when the new station in the Fretz subdivision comes into operation.

Influent Works

The waste water enters the plant via two 10-inch force-mains passing through one of two manually cleaned bar screens into the grit channels.

The bar screens prevent large objects from entering the plant. In the grit channels the velocity of flow is reduced sufficiently to allow settling of the grit and detritus material which otherwise would damage the plant. These channels are operated alternately to allow cleaning of one while the other is in use.

The flow then passes through a comminutor which further screens the sewage and cuts the screenings into fine particles. It then passes through the screen openings and to the aeration section.

The sewage flow is measured as it passes through a parshall flume.

Aeration

The four aeration tanks through a detention period provide a biological environment as was described for the King

Street plant. The mixed liquor then flows to the final clarifiers.

Final Settling

Two circular final settling tanks receive the flow and provide another detention period for the removal of activated sludge. The tanks are equipped with sludge removal facilities which return the activated sludge to the aeration tanks or waste. The clarified effluent then discharges over the weirs.

Digestion

The digestion in this plant is carried out in one stage.

The waste activated sludge is pumped into the digester. In the absence of air and at a temperature of 90 degrees Fahrenheit the decomposition and digestion takes place.

The supernatant is decanted and returned to the plant and the digested sludge is hauled away by tank truck.

DESIGN DATA

General

- a) Type of plant - activated sludge without primary tanks.
- b) Design plant flow - 850,000 gallons per day.

Grit Channels

2 parallel channels, 15 ft. long
Each channel equipped with bar screens at the head of the channel.

Comminution

1 comminutor - Jones Atwood Limited with a .75 HP motor

Aeration Section

4 units, square
Each unit 30' x 30' x 16'
Volume (four units) 44,200 cu.ft. = 276,000 gallons
Retention period 7.8 hours
Retention period 6.0 hours (30% return sludge)
Equipment : Ames Crosta Mills Limited

Final Clarifiers

2 units, circular
Each unit 30' \emptyset x 8'
Volume (two units) 11,300 cu.ft. = 70,400 gallons
Retention period - 2.0 hours
Surface settling rate - 601 gallons per sq. ft. of tank per day
Weir overflow rate - 4520 gal/lin.ft. of weir/day
Equipment - Ames Crosta Mills Limited

Activated Sludge Pumps

3 - Ames Crosta Mills with 3 HP motors

Digester

1 - unit, circular, single stage
Size - 50' \emptyset x 22' -10"
Volume 44,800 cu.ft. = 280,000 gallons

Digester - cont' d..

Heated sludge is recirculated to maintain a temperature of approximately 90⁰ Fahrenheit.

Equipment - Pacific Flush Tank

Sludge Recirculation Pump

1 - Fairbanks Morse - 250 gpm @ 25' head with a 3 HP motor

Miscellaneous Equipment

- 1 - Water circulating pump - Armstrong with 6 HP motor
- 2 - sludge pumps - Smart Turner - 100 gpm @ 27' head
with 3 HP motors

Flow Measurement

Raw sewage meter
Return sludge meter

III PLANT OPERATION

WEST SIDE WATER POLLUTION CONTROL PLANT

A) Hydraulic Loading

During the past year, 1962, the plant treated a total of 185,056 million gallons (see Table I and II). This represents an average daily flow for the year of 507,000 gallons per day.

The maximum and minimum daily flows recorded were on June 14th with 1.198 million gallons and on November 26th with 0.173 million gallons per day respectively.

Figure 1 is a probability graph showing the per cent of time that the flow is equal to or greater than a certain value. Figure 1 shows that 50% of the time the flow is equal to or greater than 470,000 gallons per day. It also indicates that the design capacity of 900,000 gallons per day was exceeded 4% of the time.

B) Grit Removal

There was very little grit removal at the plant during the year. The wet wells of the pump stations were cleaned twice during the year and a large portion of the grit removed was from these wet wells.

C) Plant Performance

Forty-eight sets of samples were collected for laboratory analysis throughout the year to determine the plant performance.

The average raw sewage BOD and suspended solids were 83 and 92 ppm respectively, therefore the plant received an average of 412 lbs. of BOD and 460 lbs. of suspended solids per day.

Figure 2 illustrates that 50% of the time the raw sewage BOD is equal to or greater than 83 ppm and Figure 3 demonstrates

that 50% of the time the raw sewage suspended solids is equal to or greater than 95 ppm.

Primary Clarifiers

There are two circular primary clarifiers with a volume of 35,300 cu.ft. or 220,000 Imp. gals. which will provide a detention time of 5.87 hours at design flow. Throughout 1962 only one clarifier was required at any one time. However, both clarifiers were alternately used to distribute the wear on the mechanisms.

The annual average daily flow was 507,000 Imp. gals. resulting in an average detention time of 5.21 hours.

The average surface settling rate was 258 Imp. gals./sq. ft. of tank/day and the average weir overflow rate was 3280 Imp. gals/lin. ft. of weir/day.

The primary clarifiers were designed to remove 709 lbs. of BOD and 1620 lbs. of suspended solids per day, assuming a reduction of 35% and 60% respectively (2 tanks). The primary removal obtained in 1962 was 36.3 % and 43.5% respectively. For a more detailed description see Tables III, IV, V and VI.

Figure 2 illustrates that 50% of the time the primary effluent BOD is equal to or greater than 53 ppm while Figure 3 shows that 50% of the time the primary effluent suspended solids is equal to or greater than 53 ppm.

Aeration Section

For most of the year three of the six aeration tanks were used and only two were used during the latter part of the year due to the weak raw sewage. The average daily BOD loading on the aeration section was 224 lbs./day which is 16.9 % of the design loading of 1321 lbs./day. The average BOD/SS ratio for the

year was 8.8 lbs. of BOD/100 lbs. of suspended solids. The average BOD per 1000 cu.ft. of aeration tank volume was 10.7 lbs. per 1000 cu.ft. A more detailed description is given in Table VII.

Final Clarifiers

There are two circular final clarifiers with a volume of 25,500 cu.ft. or 159,500 Imperial Gallons which will provide a detention time of 4.24 hours at design flow. The annual average daily flow was .507,000 Imperial Gallons per day resulting in an average detention time of 7.52 hours with two clarifiers in use or 3.76 hours with one clarifier in use.

The average surface settling rate was 159 Imperial Gallons per sq. ft. of tank per day and the average weir overflow rate was 1800 Imperial Gallons per ft. of weir per day with two clarifiers in use.

The plant was designed to remove 1880 lbs. of BOD and 2510 lbs. of suspended solids per day which represents a 93% reduction in BOD and suspended solids respectively.

On the basis of the samples analyzed, the average overall plant BOD reduction was 87.5 % and the overall plant suspended solids reduction was 82.3 %. See Tables III, IV, V and VI for more details.

Figure 2 illustrates that 50% of the time the final effluent BOD is equal to or greater than 11 ppm, while Figure 3 shows that 50% of the time the final effluent suspended solids is equal to or greater than 16 ppm.

The OWRC objectives for secondary treatment plants is that the final effluent BOD and suspended solids should not exceed 15 ppm. Examination of Figures 2 and 3 shows that the Port Colborne West Side Water Pollution Control Plant meets this objective 74% and

42% of the time respectively.

D) Chlorination

Chlorination of the final effluent was carried out for the entire year. A total of 6841 lbs. of chlorine was required to treat the total annual flow. This represents an average chlorine dosage of 3.69 ppm.

The chlorine contact chamber has a volume of 100,000 gallons which provides a 16 minute contact time at design flow. For the average daily flow of 507,000 gallons the average contact time was 28 minutes. The chlorination data is given in Table VIII.

E) Sludge Disposal

A total of 503,546 gallons of sludge was pumped to the primary digester during the year. This was an average of 2720 gallons per million gallons of sewage treated. Assuming 4% solids in the sludge, the total weight of organics removed amounted to 100.8 tons or 0.54 tons/million gallons of sewage treated. A more detailed description is given in Table IX.

IV PLANT OPERATION

EAST SIDE WATER POLLUTION CONTROL PLANT

A) Hydraulic Loading

During the past year, 1962, the plant treated a total of 111.997 million gallons. This represents an average daily flow for the year of 306,000 gallons per day. A more detailed description is given in Tables X and XI.

The maximum and minimum daily flows recorded were on December 7th with 0.661 million gallons and on July 31st with 0.099 million gallons per day respectively.

Figure 4 is a probability graph showing the per cent of time that the flow is equal to or greater than a certain value. Figure 4 shows that 50% of the time the flow is equal to or greater than 280,000 gallons per day.

B) Grit Removal

The total amount of grit removed in 1962 was 257 cu.ft. This represents an average of 2.30 cu.ft. of grit removed per million gallons of sewage treated. Details of the grit removed per month are shown in Table XII.

The figure 2.30 cu.ft. of grit removed per million gallons of sewage.

C) Plant Performance

Forty-eight sets of samples were collected for laboratory analyses through the year to determine the plant performance.

The average raw sewage BOD and suspended solids were 142 and 131 ppm respectively, therefore, the plant received an average of 425 lbs. of BOD and 388 lbs. of suspended solids per day.

Figure 5 illustrates that 50% of the time the raw sewage BOD is equal to or greater than 115 ppm, and Figure 6 demonstrates that 50% of the time the raw sewage suspended solids is equal to or greater than 115 ppm.

Aeration Section

The four aeration tanks with a combined volume of 276,000 gallons provided an average detention period of 16.6 hours based on the average daily flow of 306,000 gallons/day and 30% return sludge.

The average daily BOD loading was 425 lbs/day. The average suspended solids in the mixed liquor was 2260 ppm which yielded an average BOD/SS ratio of 6.8 lbs. of BOD per 100 lbs. of aerator solids. The average BOD loading with respect to aerator tank volume was 9.6 lbs. of BOD per 1000 cu.ft. of aerator volume. A more detailed description is given in Table XVII.

Final Clarifiers

There are two circular final clarifiers with a volume of 11,300 cu.ft. or 70,400 Imperial Gallons which will provide a detention time of 2.0 hours at design flow. The annual average daily flow was 0.306 Imperial Gallons per day resulting in an average detention time of 5.5 hours.

The average surface settling rate was 216 Imperial Gallons/sq. ft. of tank/day and the average weir overflow rate was 1630 Imperial Gallons/ft. of weir/day.

On the basis of the samples analyzed, the average overall plant BOD reduction was 81.5 % and the overall plant suspended solids reduction 79.5 %. See Tables XII, XIV, XV and XVI for more details.

Figure 5 illustrates that 50% of the time the final effluent BOD is equal to or greater than 25 ppm while Figure 6 shows that 50% of the time the final effluent suspended solids is equal to or greater than 25 ppm.

The OWRC objectives for secondary treatment plants is that the final effluent BOD and suspended solids should not exceed 15 ppm. Examination of Figures 5 and 6 shows that the Port Colborne East Side Water Pollution Control Plant meets this objective 15% and 24% of the time respectively.

D) Sludge Disposal

During the year 1962, 953,600 gallons of sludge was pumped to the digester at an average of 8,500 gallons/million gallons of raw sewage treated. Assuming 4% solids in the sludge, the total weight of organics removed amounted to 190.5 tons or 1.70 tons/million gallons of raw sewage treated. A total of 898,950 gallons of digested sludge was pumped from the digester to the tanks of the old section of the plant and allowed to settle. Of this volume, 261,600 gallons was hauled away by tank truck and the remaining 637,350 gallons was returned to the plant as supernatant. A more detailed description is given in Table XVIII.

V COST DATA

A) Capital Cost

The capital cost for the West Side Water Pollution Control Plant Project 59-S-47 was \$ 622,859.60 as of December 31, 1962.

The capital cost of the Clarke Street Pumping Station (Project 60-S-73) and associated sewers was \$ 325,726.49 as of December 31, 1962.

B) Reserve for Contingencies

As of December 31, 1962 there was a total of \$ 4,701.44 in the Reserve Fund for Project 59-S-47. There has been no money paid into the Reserve Fund for Project 60-S-73 as of December 31, 1962. The money in this fund is to be used in case of emergency or major repairs. The money in this fund is earning interest at approximately 5½%.

C) Operating Costs

East and West WPCP and seven pumping stations -

The following is the operating budget for the year 1962 together with the actual expenditures. A more detailed breakdown of costs will be found in Table XIX.

1962 budget - \$ 70,000 + taxes (\$ 3,727.08)

1962 expenditures - \$ 56,400.48

Unit operating costs

- per pound BOD removed	\$ 0.22
- per pound of SS removed	\$ 0.23
- per million gallons treated	\$ 190.00

Operating Cost Cont' d....

- per capita (14,950 pop) \$ 3.77

D) Total Cost

The total cost to the municipality during 1962 was as follows : (excluding Project 60-S-73)

Operating	\$ 56,400.48
Debt Retirement	12,621.00
Reserve	4,603.00
Interest	<u>35,961.00</u>
TOTAL	\$ 109,585.48

On the basis of the population of 14,950 the total amount cost of the Port Colborne Water Pollution Control System (both East and West plants) was approximately \$ 7.33 per person.

VI SUPERVISION

The project was under a 24 hour supervision by a staff consisting of a superintendent, a maintenance mechanic and six operators. At the close of the year 1962, the staff consisted of the following :

J. Telfer	-	Superintendent
J. Blanchard	-	Maintenance Mechanic
J. Bilodeau	-	Operator
M. Baggio	-	Operator
C. W. Root	-	Operator
J. Sieber	-	Operator
S. Toth	-	Operator
E. Young	-	Operator

The duties of the plant staff were such as to maintain the highest quality possibly in the effluent. In order to do so, tests were carried out at the plants daily by the staff. Samples were also taken weekly and sent to the OWRC laboratory for analysis. The staff was also responsible for maintaining all of the equipment, grounds and buildings. The staff should be congratulated on their operation of the project.

The operation of the project is under the supervision of the Division of Plant Operations. During the year regular visits were made by the head office project engineer. The head office Maintenance Section made six visits which included inspections and setting up of maintenance schedules for the equipment. The head office Electronics Section also made several visits to the project.

Approximately 60 invoices were handled by the head office staff during the year. The head office expenses were not charged to the project.

After the completion of an OWRC constructed project, the Plant Operations Division of the OWRC assumes responsibility for the operation, maintenance and control of the project. However, the OWRC does wish to work in close co-operation with the local authorities. In order to do so, a Local Advisory Committee is formed consisting of representatives from all parties with an interest in the project. The number of meetings held during the year varies with the size and complexity of the project.

For the Port Colborne Project, representatives from the Town of Port Colborne were in the Committee. The Committee met four times during the year 1962. Operation, the annual budget, insurance and the official opening of the project were some of the major items discussed at the meetings.

TABLE I

PORT COLBORNE WATER POLLUTION CONTROL PLANT (WEST)

WEEK ENDING	FLOW 1962			
	TOTAL FLOW MG	AVG. DAILY FLOW MGD	MAX. DAILY FLOW MGD	MIN. DAILY FLOW MGD
JAN. 6	3.264	0.545		
13	3.715	0.531	0.731	0.379
20	4.590	0.656	1.012	0.463
27	3.415	0.488	0.879	0.185
31	1.874	0.469	0.745	0.363
	16.858	0.544		
FEB. 3	1.183	0.395	0.427	0.357
10	3.430	0.490	0.788	0.299
17	2.295	0.328	0.397	0.268
24	2.926	0.418	0.541	0.259
28	2.914	0.728	0.953	0.361
	12.748	0.456		
MAR. 3	1.610	0.537	0.700	0.452
10	3.091	0.442	0.691	0.311
17	6.194	0.885	1.020	0.758
24	5.219	0.746	0.898	0.632
31	4.106	0.587	0.728	0.482
	20.220	0.652		
APR. 7	4.243	0.606	0.665	0.555
14	4.232	0.605	0.646	0.577
21	3.650	0.521	0.635	0.445
28	3.386	0.484	0.568	0.357
30	1.008	0.504	0.538	0.470
	16.519	0.551		

WEE. ENDING	FLOW 1962			
	TOTAL FLOW MG	AVG. DAILY FLOW MGD	MAX. DAILY FLOW MGD	MIN. DAILY FLOW MGD
MAY 5	2.330	0.466	0.486	0.425
12	3.133	0.448	0.567	0.337
19	3.143	0.449	0.490	0.409
26	3.121	0.446	0.512	0.340
31	2.228	0.446	0.464	0.430
	13.955	0.460		
JUNE 2	0.915	0.457	0.468	0.447
9	3.377	0.482	0.542	0.413
16	5.902	0.843	1.198	0.546
23	5.056	0.722	1.017	0.523
30	3.804	0.543	0.715	0.475
	19.054	0.635		
JULY 7	3.216	0.459	0.510	0.349
14	3.515	0.502	0.525	0.476
21	3.187	0.455	0.503	0.420
28	3.220	0.460	0.534	0.407
31	1.309	0.441	0.458	0.410
	14.447	0.466		
AUG. 4	1.777	0.411	0.466	0.422
11	3.326	0.475	0.526	0.431
18	3.077	0.440	0.501	0.411
25	3.097	0.442	0.556	0.357
31	2.363	0.394	0.410	0.376
	13.640	0.441		

WEEK ENDING	FLOW 1962			
	TOTAL FLOW MG	AVG. DAILY FLOW MGD	MAX. DAILY FLOW MGD	MIN. DAILY FLOW MGD
SEPT. 1	0.503	0.503	0.503	0.503
8	2.878	0.411	0.504	0.290
15	2.871	0.410	0.476	0.386
22	2.506	0.358	0.402	0.334
29	3.596	0.514	0.907	0.315
30	0.601	0.601	0.601	0.601
	12.955	0.432		
OCT. 6	3.352	0.570	0.751	0.483
13	3.339	0.477	0.552	0.330
20	3.543	0.506	0.563	0.395
27	4.247	0.607	0.678	0.554
31	2.092	0.501	0.592	0.483
	16.573	0.535		
NOV. 3	1.416	0.501	0.524	0.380
10	2.970	0.424	1.137	0.199
17	3.263	0.466	1.074	0.223
24	2.287	0.327	0.400	0.228
30	1.943	0.341	0.492	0.173
	11.879	0.396		
DEC. 1	0.442	0.341	0.442	0.442
8	4.349	0.621	0.977	0.326
15	3.990	0.570	0.742	0.477
22	3.411	0.487	0.508	0.469
29	3.193	0.456	0.509	0.428
31	.823	0.412	0.436	0.387
	16.208	0.523		

TABLE II

PORT COLBORNE WATER POLLUTION CONTROL PLANT (WEST)

WEEK ENDING	FLOW 1962			
	TOTAL FLOW MG	AVG. DAILY FLOW MGD	MAX. DAILY FLOW MGD	MIN. DAILY FLOW MGD
JAN.	16.858	0.544	1.012	0.185
FEB.	12.748	0.456	0.953	0.259
MAR.	20.220	0.652	1.020	0.311
APR.	16.519	0.551	0.646	0.357
MAY	13.955	0.460	0.567	0.337
JUNE	19.054	0.635	1.198	0.413
JULY	14.447	0.466	0.534	0.349
AUG.	13.640	0.441	0.556	0.357
SEPT.	12.955	0.432	0.907	0.290
OCT.	16.573	0.535	0.751	0.330
NOV.	11.879	0.396	1.137	0.173
DEC.	16.208	0.523	0.977	0.326
YEAR	185.056	0.507	1.198	0.173

TABLE III

PORT COLBORNE WATER POLLUTION CONTROL PLANT (WEST)

WEEKLY BOD LOADING AND REMOVAL

WEEK ENDING	RAW SEWAGE		PRIMARY EFF.		PRIMARY REMVL.		FINAL EFF.		TOTAL REMOVAL	
	PPM	LBS/DAY	PPM	LBS/DAY	LBS/DAY	%	PPM	LBS/DAY	LBS/DAY	%
JAN. 6										
13										
20	40	262					8.0	53	209	80.0
27	115	561					12.0	59	502	89.6
FEB. 3	112	489					6.0	26	463	94.6
10	46	225					6.8	33	192	85.1
17	88	289					6.8	22	267	92.3
24	94	394					7.2	30	364	92.4
MAR. 3	40	214					6.0	32	182	85.0
10	72	318	44	194	124	39	3.6	16	302	95.0
17										
24	49	366	33	246	120	33	4.0	30	336	89.5
31	72	422	44	258	164	39	4.4	26	396	94.0
APR. 7	55	333	60	363	+ 30	+ 9	15.0	91	242	73.0
14	72	435	18	109	326	75	8.0	48	387	89.0
21	94	490	58	302	188	38.4	10.0	52	438	89.5
28	140	677	62	300	377	55.7	6.0	29	648	95.8
MAY 5	95	443	64	298	145	32.8	15.0	70	373	84.2
12	110	493	68	305	188	38.2	14.0	63	430	87.3
19	70	314	110	494	+180	+57.2	9.0	40	274	87.3
26	95	423	58	259	164	38.8	3.6	16	407	96.2

WEEK ENDING	RAW SEWAGE		PRIMARY EFF.		PRIMARY REMVL		FINAL EFF.		TOTAL REMOVAL	
	PPM	LBS/DAY	PPM	LBS/DAY	LBS/DAY	%	PPM	LBS/DAY	LBS/DAY	%
JUNE 2	145	664	65	297	367	53.7	10.0	46	618	93.0
9	66	318	40	193	125	39.3	9.2	44	274	86.2
16	24	202	15	126	76	37.6	13.0	110	92	73.5
23	6	43	10	72	+ 29	+67.4	11.0	79	+ 36	+83.7
30	58	315	42	228	87	27.6	6.0	32	283	90.0
JULY 7	76	349	36	165	184	52.5	2.4	11	338	97.0
14	38	191	42	211	+ 20	+ 9.5	4.0	20	171	89.5
21	75	341	64	291	50	15.0	16.0	73	268	79.0
28	65	299	50	230	69	23.0	9.6	44	255	85.0
AUG. 4	96	423	60	265	158	37.5	6.4	28	395	93.5
11	24	114	20	95	19	16.5	4.0	19	95	83.5
18	80	352	53	233	119	34.0	5.2	23	329	93.5
25	66	292	43	190	102	35.0	10.0	44	248	85.0
SEPT. 1	95	389	58	237	152	39.1	10.0	41	348	89.5
8	100	411	52	214	197	48.1	23.0	95	316	77.0
15	110	451	64	262	189	42.1	13.0	53	398	88.4
22	116	415	64	229	186	44.8	35.0	125	290	69.9
29	134	689	96	493	196	28.4	15.0	77	612	88.9
OCT. 6	82	467	50	285	182	39.0	9.2	52	415	89.0
13	100	477	78	372	105	22.0	14.0	67	410	86.0
20	125	633	72	364	269	42.5	12.0	61	572	90.5
27	68	413	51	310	103	25.0	10.0	61	352	85.0
NOV. 3	90	451	50	251	200	44.5	10.0	50	401	89.0
10	110	466	60	254	212	45.5	5.2	22	444	95.0
17	62	289	39	182	107	37.0	11.0	51	238	82.0
24	115	376	26	85	291	77.5	14.0	46	330	88.0

WEEK	RAW SEWAGE		PRIMARY EFF.		PRIMARY REMVL		FINAL EFF.		TOTAL REMOVAL	
	PPM	LBS/DAY	PPM	LBS/DAY	LBS/DAY	%	PPM	LBS/DAY	LBS/DAY	%
ENDING										
DEC. 1	104	355	58	198	157	44.0	23.0	78	277	78.0
8	114	707	86	534	173	24.5	17.0	105	602	85.0
15	60	342	50	285	57	16.6	21.0	120	222	64.9
22	92	448	86	419	29	6.5	21.0	102	346	77.2

TABLE IV

PORT COLBORNE WATER POLLUTION CONTROL PLANT (WEST)

MONTHLY BOD LOADING AND REMOVAL

MONTH	RAW SEWAGE		PRIMARY EFFLUENT		PRIMARY REMOVAL		FINAL EFFLUENT		TOTAL REMOVAL	
	PPM	LBS/MO	PPM	LBS/MO	LBS/MO	%	PPM	LBS/MO	LBS/MO	%
JANUARY	77	12,950	*49	* 8,250	* 4,700	* 36.3	10	1,700	11,250	86.9
FEBRUARY	85	10,850	*54	* 6,900	* 3,950	* 36.3	7	900	9,950	91.9
MARCH	64	12,950	40	8,100	4,850	37.5	4	800	12,150	93.9
APRIL	90	14,850	49	8,100	6,750	45.5	10	1,650	13,200	89.0
MAY	92	12,850	75	10,450	2,400	18.6	10	1,400	11,450	89.1
JUNE	60	11,400	34	6,450	4,950	43.4	10	1,900	9,500	83.4
JULY	63	9,100	48	6,950	2,150	23.7	8	1,150	7,950	87.4
AUGUST	67	9,150	44	6,000	3,150	34.4	6	800	8,350	91.2
SEPT.	111	14,400	67	8,700	5,700	39.6	19	2,450	11,950	83.0
OCT.	94	15,550	63	10,450	5,100	32.9	11	1,800	13,750	88.4
NOV.	94	11,150	44	5,250	5,900	53.0	10	1,200	9,950	89.4
DEC.	93	15,100	70	11,300	3,800	25.0	20	3,250	11,850	78.4
YEAR	83	150,300	53	81,750	53,400	36.3	10	19,000	131,300	87.5

* Estimated

TABLE V

PORT COLBORNE WATER POLLUTION CONTROL PLANT (WEST)

WEEKLY SUSPENDED SOLIDS LOADING AND REMOVAL

1962

WEEK ENDING	RAW SEWAGE		PRIM. EFFLUENT		PRIM. REMOVAL		FINAL EFFLUENT		TOTAL REMOVAL	
	PPM	LBS/DAY	PPM	LBS/DAY	LBS/DAY	%	PPM	LBS/DAY	LBS/DAY	%
JAN. 6										
13										
20	52	341					22	144	197	57.7
27	92	449					28	137	312	69.6
FEB. 3	136	594					36	157	437	73.6
10	42	206					20	98	108	52.5
17	82	269					28	92	177	65.9
24	70	293					10	42	251	85.6
MAR. 3	66	255					18	97	258	72.7
10	82	362	52	230	132	36.4	26	115	247	68.3
17										
24	64	477	30	224	253	53.0	8	60	417	87.3
31	88	516	64	376	140	27.1	28	164	352	70.0
APR. 7	66	400	60	364	36	9.0	34	206	194	48.5
14	102	615	58	351	264	43.0	18	109	506	82.4
21	98	511	46	240	271	53.0	34	177	334	65.4
28	118	571	58	281	290	50.9	18	87	484	84.8
MAY 5	90	419	60	279	140	33.4	20	93	326	78.0
12	122	546	90	403	143	26.2	24	107	439	80.4
19	76	342	102	458	116	34.0	14	63	279	81.5
26	128	571	72	321	250	43.8	10	45	526	92.0

TABLE V

WEEK ENDING	RAW SEWAGE		PRIM. EFFLUENT		PRIM. REMOVAL		FINAL EFFLUENT		TOTAL REMOVAL	
	PPM	LBS/DAY	PPM.	LBS/DAY	LBS/DAY	%	PPM	LBS/DAY	LBS/DAY	%
JUNE 16	34	286	24	202	84	29.4	9	76	210	73.5
23	19	137	23	166	29	21.2	17	123	14	10.2
30	84	456	29	157	299	65.6	9	49		
JULY 7	95	436	38	174	262	61.5	6	27	409	94.0
14	75	377	48	241	136	36.0	9	45	332	88.0
21	92	419	56	255	164	39.0	9	41	378	90.2
28	134	616	48	221	395	64.0	2	9	607	98.5
AUG. 4	116	512	51	225	287	56.0	6	26	486	95.0
11	56	266	29	138	128	48.0	10	48	218	82.0
18	126	554	68	299	255	46.0	34	150	404	73.0
25	132	583	78	345	238	41.0	24	106	477	82.0
SEPT. 1	88	442	54	271	171	38.7	26	131	311	70.4
8	150	617	106	436	181	29.5	34	140	477	77.5
15	168	689	76	312	377	55.0	30	123	566	82.0
22	92	329	42	150	179	54.4	8	28	301	91.5
29	109	561	54	278	283	50.4	7	36	525	93.5

TABLE V

PORT COLBORNE WATER POLLUTION CONTROL PLANT (WEST)

WEEKLY SUSPENDED SOLIDS LOADING & REMOVAL

1962

MONTH	RAW SEWAGE		PRIM. EFFLUENT		PRIM. REMOVAL		FIN. EFFLUENT		TOTAL REMOVE.	
	PPM	LB/DAY	PPM	LB/DAY	LBS/DAY	%	PPM	LB/DAY	LB/DAY	%
<u>October</u>										
6	82	467	41	234	233	50.0	2.0	11	456	97.5
13	90	429	90	429	0	0.0	10.0	48	381	89.0
20	142	719	56	283	436	60.5	7.0	35	684	95.0
27	82	498	41	249	249	50.0	7.0	42	456	91.5
<u>November</u>										
3	90	451	39	195	256	56.5	5.0	25	426	94.5
10	87	369	38	161	208	56.0	4.0	17	352	95.5
17	77	359	32	149	210	58.5	3.0	14	345	96.0
24	108	353	36	118	235	66.5	9.0	29	324	92.0
<u>December</u>										
1	99	338	36	123	215	63.5	10.0	34	304	90.0
8	143	888	73	453	435	49.0	6.0	37	851	96.0
15	69	393	42	239	154	39.1	10.0	57	336	85.4
22	93	453	52	253	200	44.0	11.0	54	399	88.0

TABLE VI

PORT COLBORNE WATER POLLUTION CONTROL PLANT (WEST)

MONTHLY SUSPENDED SOLIDS LOADING AND REMOVAL

1 9 6 2

MONTH	RAW SEWAGE		PRIMARY EFFLUENT		PRIMARY REMOVAL		FINAL EFFLUENT		TOTAL REMOVAL	
	PPM	LBS/MO	PPM	LBS/MO	LBS/MO	%	PPM	LBS/MO	LBS/MO	%
January	72	12,150	* 41	*6,900	*5,250	* 43.2	25	4,200	7,950	65.4
February	82	10,450	* 46	*5,850	*4,600	* 43.8	24	3,050	7,400	70.8
March	78	15,750	49	9,900	5,850	37.2	21	4,250	11,500	73.1
April	96	15,850	55	9,100	6,750	42.7	26	4,300	11,550	73.0
May	104	14,500	81	11,300	3,200	22.1	17	2,400	12,100	83.5
June	58	11,050	37	7,050	4,000	36.2	15	2,900	8,150	74.0
July	99	14,450	47	6,800	7,650	52.7	7	1,000	13,450	93.0
August	107	14,600	57	7,800	6,800	46.7	18	2,450	12,150	83.3
September	121	15,650	66	8,550	7,100	45.4	21	2,700	12,950	82.7
October	99	16,400	57	9,450	6,950	42.4	7	1,150	15,250	93.0
November	91	10,700	36	4,250	6,450	60.3	5	600	10,100	94.5
December	101	16,350	51	8,250	8,100	49.6	9	1,450	14,900	91.1
TOTAL:	92	167,900	52	95,200	72,700	43.5	16	30,450	137,450	82.3

* estimated

TABLE VII

PORT COLBORNE WATER POLLUTION CONTROL PLANT (WEST)

AERATION SECTION1962

WEEK ENDING	MIXED LIQUOR S.S. (PPM)	SETT. SOLIDS %	SLUDGE VOLUME INDEX	SLUDGE AGE (DAYS)	BOD/100 LBS. SUS. SOLIDS	BOD/1,000 CU. FT. AERATOR VOL/DAY (LBS.)
Jan. 6						
13		13.0				
20		17.0				
27		21.0				
Feb. 3		22.0				
10		26.0				
17		20.0				
24		24.0				
Mar. 3		18.5				
10	2,812	21.0	75	19.9	4.2	7.4
17		18.0				
24	2,776	20.0	72	20.2	5.5	9.4
31	2,494	23.0	92	10.8	6.3	9.9
Apr. 7	2,606	26.0	98	11.7	8.5	13.9
14	2,878	25.2	84	13.4	2.3	4.2
21	3,034	29.9	128	20.6	6.1	11.5
28	2,486	28.4	106	14.4	7.4	11.5
May 5	2,450	27.0	107	14.3	7.5	11.4
12	3,128	33.0	105	12.7	6.0	11.7
19	2,012	27.0	134	7.2	15.0	18.9
26	2,086	32.0	153	10.6	7.6	9.9

WEEK ENDING	MIXED LIQUOR S.S. (PPM)	SETT. SOLIDS %	SLUDGE VOLUME INDEX	SLUDGE AGE (DAYS)	BOD/100 LBS. SUS. SOLIDS	BOD/1,000 CU. FT. AERATOR VOL/DAY (LBS.)
June 2	2,146	23.0	107	12.0	8.5	11.4
9	2,540	26.0	102	19.5	4.6	7.4
16	2,504	26.0	104	12.4	3.1	4.8
23	2,256	28.0	124	22.2	2.0	2.8
30	2,940	27.0	92	30.5	4.8	8.7
July 7	2,760	29.0	105	25.9	3.7	6.3
14	2,824	29.0	102	19.2	4.6	8.1
21	3,700	54.0	146	23.7	4.8	11.2
28	3,200	43.0	134	23.6	4.4	8.8
Aug. 4	3,428	70.0	202	24.8	4.7	10.2
11	2,766	50.0	181	32.7	2.1	3.6
18	3,326	61.0	183	18.1	4.3	8.9
25	2,658	34.0	128	12.5	4.4	7.3
Sept. 1	2,262	75.0	331	13.6	6.4	9.1
8	2,346	73.0	311	8.8	5.6	8.2
15	2,740	70.0	255	14.3	5.9	10.0
22	2,932	63.0	215	31.9	4.8	8.8
29	1,240	64.0	516	7.3	24.4	18.9
Oct. 6	1,252	42.0	335	8.7	14.0	10.9
13	1,258	31.0	247	4.8	18.1	14.2
20	1,624	24.0	148	9.5	13.7	13.9
27	1,384	32.0	231	9.0	13.8	11.9
Nov. 3	870	62.0	713	7.3	17.7	9.6
10	1,618	78.0	482	16.4	9.6	9.7
17	1,148	73.0	636	12.5	9.7	6.9
24*	1,648	86.0	522	22.7	3.2	3.3

WEEK ENDING	MIXED LIQUOR S.S. (PPM)	SETT. SOLIDS %	SLUDGE VOLUME INDEX	SLUDGE AGE (DAYS)	BOD/100 LBS. SUS. SOLIDS	BOD/1,000 CU. FT. AERATOR VOL/DAY (LBS.)
Dec. 1*	2,156	94.0	436	19.0	8.5	11.4
8*	2,586	54.0	209	6.2	19.0	30.7
15*	1,086	13.0	120	4.9	24.1	16.4
22*	1,110	14.5	131	4.7	34.9	24.1

* Using two tanks.

TABLE VIIIPORT COLBORNE WATER POLLUTION CONTROL PLANTCHLORINATION1 9 6 2

MONTH	CHLORINE USED LBS.	DOSAGE LBS/MG SEWAGE	DOSAGE PPM	RESIDUAL PPM
January	513	37.7	3.77	0.20
February	314	24.6	2.46	0.70
March	398	19.7	1.97	0.37
April	337	20.4	2.04	0.51
May	342	24.5	2.45	0.61
June	488	25.6	2.56	0.44
July	578	40.0	4.00	0.50
August	598	43.8	4.38	0.75
September	773	59.6	5.96	0.43
October	992	59.9	5.99	0.66
November	600	50.6	5.06	0.42
December	908	56.0	5.60	0.41
YEAR:	6841	36.9	3.69	

TABLE IXPORT COLBORNE WATER POLLUTION CONTROL PLANT (WEST)DIGESTER OPERATION1 9 6 2

MONTH	SLUDGE TO DIGESTER (GAL)	GALLONS OF SLUDGE TO DIGESTER PER MG RAW SEWAGE (GAL)	SUPERNATANT RETURNED (GAL)	DIGESTED SLUDGE HAULED (GAL)	GAS PRO- DUCED (CU FT)
January	20,000	1470	-----	-----	35,949
February	18,080	1415	-----	-----	95,687
March	15,630	775	-----	-----	79,909
April	17,053	1030	-----	-----	84,663
May	23,399	1675	-----	-----	103,312
June	13,157	690	-----	-----	74,225
July	13,800	955	-----	-----	82,359
August	31,090	2270	-----	-----	85,707
September	102,767	7940	42,008	14,355	97,826
October	103,448	6250	62,841	-----	100,110
November	89,042	7500	43,572	8,400	71,672
December	56,080	3460	36,830	-----	59,887
YEAR:	503,546	2720	185,251	22,755	971,306

TABLE X

PORT COLBORNE WATER POLLUTION CONTROL PLANT (EAST)

WEEK ENDING	F L O W - 1 9 6 2			
	TOTAL FLOW MG	AVG.DAILY FLOW MGD	MAX.DAILY FLOW MGD	MIN.DAILY FLOW MGD
Jan. 6	1.917		0.420	0.214
13	2.724	0.389	0.593	0.285
20	2.705	0.386	0.532	0.276
27	2.632	0.376	0.653	0.258
31	1.302	0.326	0.381	0.269
	11.280	0.357		
Feb. 3	0.871	0.290	0.382	0.200
10	2.883	0.412	0.645	0.303
17	1.876	0.267	0.398	0.149
24	2.388	0.341	0.432	0.243
28	2.102	0.525	0.631	0.357
	10.120	0.361		
Mar. 3	1.456	0.485	0.613	0.370
10	2.830	0.404	0.482	0.332
17	2.843	0.406	0.557	0.121
24	2.979	0.426	0.484	0.376
31	2.537	0.362	0.412	0.300
	12.645	0.408		
Apr. 7	2.677	0.382	0.433	0.328
14	2.968	0.424	0.489	0.374
21	2.802	0.400	0.442	0.350
28	2.312	0.330	0.394	0.268
30	0.573	0.286	0.306	0.266
	11.332	0.378		
May 5	1.571	0.314	0.338	0.302
12	2.031	0.290	0.322	0.272
19	1.741	0.250	0.267	0.222
26	1.880	0.270	0.434	0.219
31	1.283	0.257	0.263	0.247
	8.506	0.274		

TABLE X

PORT COLBORNE WATER POLLUTION CONTROL PLANT (EAST)

WEEK ENDING	F L O W - 1 9 6 2			
	TOTAL FLOW MG	AVG.DAILY FLOW MGD	MAX.DAILY FLOW MGD	MIN.DAILY FLOW MGD
June 2	0.470	0.235	0.254	0.216
9	1.610	0.230	0.262	0.213
16	3.288	0.470	0.626	0.211
23	2.830	0.404	0.575	0.286
30	2.415	0.345	0.513	0.270
	10.613	0.354		
July 7	1.671	.240	.261	.213
14	1.506	.215	.238	.193
21	1.530	.219	.283	.115
28	1.639	.234	.318	.177
31	.400	.133	.192	.099
	6.746	.217		
Aug. 4	.843	.210	.226	.185
11	1.923	.275	.480	.162
18	1.643	.234	.279	.210
25	1.894	.271	.390	.225
31	1.287	.214	.252	.195
	7.590	.245		
Sept. 1	.219	.219	.219	.219
8	1.294	.185	.202	.167
15	1.337	.191	.221	.171
22	1.169	.167	.203	.131
29	2.172	.310	.646	.156
30	.308	.308	.308	.308
	6.499	.216		

TABLE X

PORT COLBORNE WATER POLLUTION CONTROL PLANT (EAST

WEEK ENDING	F L O W - 1 9 6 2			
	TOTAL FLOW MG	AVG.DAILY FLOW MGD	MAX.DAILY FLOW MGD	MIN. DAILY FLOW MGD
Oct. 6	1.656	.281	.472	.189
13	1.783	.252	.491	.200
20	1.826	.261	.414	.187
27	2.185	.312	.390	.249
31	1.025	.255	.264	.246
	8.475	.274		
Nov. 3	.759	.255	.262	.243
10	2.004	.286	.645	.200
17	2.563	.366	.595	.230
24	2.236	.320	.376	.274
30	1.458	.239	.286	.219
	9.020	.300		
Dec. 1	.214	.239	.214	.214
8	2.617	.374	.661	.207
15	2.147	.307	.446	.241
22	1.884	.269	.287	.246
29	1.830	.261	.281	.244
31	.479	.239	.252	.227
	9.171	.296		

TABLE XI

PORT COLBORNE WATER POLLUTION CONTROL PLANT (EAST)

WEEK ENDING	F L O W - 1 9 6 2			
	TOTAL FLOW MG	AVG. DAILY FLOW MGD	MAX.DAILY FLOW MGD	MIN.DAILY FLOW MGD
Jan.	11.280	0.357	0.653	0.214
Feb.	10.120	0.361	0.382	0.149
Mar.	12.645	0.408	0.613	0.121
Apr.	11.332	0.378	0.489	0.266
May	8.506	0.274	0.434	0.219
June	10.613	0.354	0.626	0.211
July	6.746	0.217	0.318	0.099
Aug.	7.590	0.245	0.226	0.162
Sept.	6.499	0.216	0.646	0.131
Oct.	8.475	0.274	0.491	0.187
Nov.	9.020	0.300	0.645	0.200
Dec.	9.171	0.296	0.661	0.207
YEAR	111.997	0.306	0.661	0.099

TABLE XII

PORT COLBORNE WATER POLLUTION CONTROL PLANT (EAST)

GRIT REMOVAL - 1962

<u>MONTH</u>	<u>CUBIC FEET REMOVED</u>	<u>CU.FT./MG SEWAGE</u>
January	30	2.66
February	8	0.79
March	25	1.98
April	22	1.94
May	32	3.76
June	8	0.75
July	0	0
August	0	0
September	54	8.33
October	0	0
November	42	4.66
December	36	3.93
YEAR:	<hr/> 257	<hr/> 2.30

TABLE XIII

PORT COLBORNE WATER POLLUTION CONTROL PLANT (EAST)WEEKLY B.O.D. LOADING & REMOVAL1962

WEEK ENDING	RAW SEWAGE		FINAL EFFLUENT		TOTAL REMOVAL	
	PPM	LBS/DAY	PPM	LBS/DAY	LBS/DAY	%
JAN. 6	165	468	37	105	363	77.5
13						
20	74	286	33	127	159	55.5
27	105	395	26	98	297	75.0
FEB. 3	114	354	37	115	239	67.5
10	106	437	41	169	268	61.5
17	130	347	39	104	243	70.0
24	114	389	31	106	283	73.0
MAR. 3	60	305	27	137	168	55.0
10	80	323	24	97	226	70.0
17						
24	110	469	45	190	279	59.0
31	98	355	22	80	275	77.5
APR. 7	180	690	30	115	575	84.5
14	144	611	18	76	535	87.5
21	265	1060	13	52	1008	95.0
28	130	429	20	66	363	84.6

WEEK ENDING	RAW SEWAGE		FINAL EFFLUENT		TOTAL REMOVAL	
	PPM	LBS/DAY	PPM	LBS/DAY	LBS/DAY	%
MAY 5	295	903	30	92	811	90.0
12	76	220	34	99	121	55.0
19	135	338	25	63	275	81.5
26	80	216	26	70	146	67.5
JUNE 2	155	387	52	130	257	66.5
9	85	196	56	129	67	34.0
16	54	254	9	42	212	83.0
23	8	32	15	61	+ 29	+ 47.0
30	64	221	14	48	173	78.0
JULY 7	82	197	16	38	159	80.5
14	104	224	24	52	172	77.0
21	195	427	11	24	403	94.5
28	66	154	22	51	103	66.5
AUG. 4	500	890	14	25	865	97.0
11	165	454	10	28	426	94.0
18	146	342	6.4	15	327	95.5
25	105	285	10	27	258	90.5
SEPT. 1	175	376	15	32	344	91.5
8	190	352	17	31	321	91.0
15	180	344	14	27	317	92.0
22	105	175	50	84	91	52.5
29	130	403	56	174	229	57.0
OCT. 6	116	326	8.8	25	301	92.5
13	600	1512	37	93	1419	94.0
20	140	365	23	60	305	83.5
27	96	300	23	72	228	76.0

WEEK ENDING	RAW SEWAGE		FINAL EFFLUENT		TOTAL REMOVAL	
	PPM	LBS/DAY	PPM	LBS/DAY	LBS/DAY	%
NOV. 3	98	250	30	77	173	69.5
10	135	386	18	51	335	86.5
17						
24						
DEC. 1	128	306	24	57	249	81.0
8	120	449	29	108	341	76.0
15	112	344	37	114	230	66.8
22	190	511	24	65	446	87.0

TABLE XIV

PORT COLBORNE WATER POLLUTION CONTROL PLANT (EAST)MONTHLY BOD LOADING & REMOVAL1962

MONTH	RAW SEWAGE		FINAL EFFLUENT		TOTAL REMOVAL	
	PPM	LBS/MO	PPM	LBS/MO	LBS/MO	%
JANUARY	120	13,550	25	2,800	10,750	79.3
FEBRUARY	116	11,750	37	3,750	8,000	68.0
MARCH	87	11,000	30	3,800	7,200	65.5
APRIL	179	20,300	20	2,250	18,050	88.9
MAY	146	12,400	29	2,500	9,900	80.0
JUNE	73	7,750	29	3,100	4,650	60.1
JULY	112	7,550	18	1,200	6,350	84.0
AUGUST	229	17,400	10	750	16,650	95.8
SEPTEMBER	156	10,100	31	2,000	8,100	80.2
OCTOBER	238	20,200	23	1,950	18,250	90.6
NOVEMBER	116	10,450	24	2,200	8,250	79.0
DECEMBER	138	12,650	29	2,700	9,950	78.5
YEAR	142	155,100	25	29,000	126,100	81.5

TABLE XV

PORT COLBORNE WATER POLLUTION CONTROL PLANT (EAST)

WEEKLY SS LOADING & REMOVAL

WEEK ENDING	RAW SEWAGE		FINAL EFFLUENT		TOTAL REMOVAL	
	PPM	LBS/DAY	PPM	LBS/DAY	LBS/DAY	%
JAN. 6	142	403	40	114	289	71.9
13	114	443	36	140	303	68.0
20	54	208	24	93	115	55.6
27	110	413	30	113	300	72.6
FEB. 3	92	267	32	93	174	65.3
10	132	544	46	190	354	65.1
17	156	416	32	86	330	79.6
24	96	327	36	123	204	62.5
MAR. 3	42	214	40	204	10	4.8
10	84	339	60	243	96	28.6
17						
24	78	332	54	230	102	30.8
31	96	348	38	137	211	60.4
APR. 7	114	436	52	199	237	54.3
14	96	407	30	127	280	68.7
21	90	360	50	200	160	44.5
28	120	396	26	86	310	78.4
MAY 5	146	448	36	110	338	75.4
12	104	301	28	81	220	73.1
19	164	410	38	95	315	76.8
26	270	730	32	86	644	88.2
JUNE 2	202	505	16	40	465	92.1
9	132	346	21	55	291	84.1
16	60	375	9	56	319	85.0
23	28	113	7	28	85	75.0
30	93	321	10	35	286	89.2

WEEK ENDING	RAW SEWAGE		FINAL EFFLUENT		TOTAL REMOVAL	
	PPM	LBS/DAY	PPM	LBS/DAY	LBS/DAY	%
JULY 7	100	240	14	34	206	86.0
14	130	280	14	30	250	89.0
21	146	320	8	18	302	94.5
28	90	211	4	9	202	95.5
AUG. 4	252	449	13	23	426	95.0
11	102	281	15	41	240	79.5
18	140	328	14	33	295	90.0
25	138	374	42	114	260	69.5
SEPT. 1	176	378	10	22	356	94.5
8	160	296	32	59	237	80.0
15	218	416	40	76	340	82.0
22	104	174	10	17	157	90.5
29	130	403	8	25	358	94.0
OCT. 6	127	357	3	8	349	98.0
13	388	978	4	10	968	98.5
20	119	311	27	70	241	77.5
27	101	315	9	28	287	91.0
NOV. 3	99	252	11	28	224	89.0
10	114	326	11	31	295	90.5
DEC. 1	119	284	14	33	251	88.0
8	120	449	12	44	405	90.0
15	98	301	14	43	258	85.7
22	216	581	12	32	549	94.0

TABLE XVI

PORT COLBORNE WATER POLLUTION CONTROL PLANT (EAST)

MONTHLY SUSPENDED SOLIDS LOADING AND REMOVAL

MONTH	RAW SEWAGE		FINAL EFFLUENT		TOTAL REMOVAL	
	PPM	LBS/MO.	PPM	LBS/MO.	LBS/MO.	%
JANUARY	105	11,850	32	3,600	8,250	69.6
FEBRUARY	119	12,050	36	3,600	8,450	69.8
MARCH	75	9,500	48	6,100	3,400	35.9
APRIL	105	11,900	37	4,200	7,700	64.7
MAY	171	14,500	33	2,800	11,700	80.7
JUNE	129	13,700	16	1,700	12,000	87.7
JULY	116	7,850	10	700	7,150	91.2
AUGUST	158	12,000	21	1,600	10,400	86.7
SEPTEMBER	158	10,250	20	1,300	8,950	87.2
OCTOBER	184	15,600	11	950	14,650	94.0
NOVEMBER	107	9,650	11	1,000	8,650	89.6
DECEMBER	141	12,900	13	1,200	11,700	90.7
YEAR	131	141,750	24	28,750	113,000	79.5

TABLE XVII

PORT COLBORNE WATER POLLUTION CONTROL PLANT (EAST)

AERATION SECTION

WEEK ENDING	MIXED LIQUOR S.S. (PPM)	SETTLEABLE SOLIDS %	SLUDGE VOLUME INDEX	SLUDGE AGE (DAYS)	BOD' LB/ 100 LBS S.S.	BOD LB/ 1,000 CU.FT AER. VOL/ DAY (LBS)
JAN. 6	3,404	21.3	62.5	23.3	5.0	10.6
13		19.1				11.9
20	2,404	18.6	77.4	31.9	4.3	6.5
27	2,422	15.8	65.1	16.2	5.9	9.0
FEB. 3	1,678	13.9	82.9	17.3	7.7	8.0
10	1,708	12.2	71.4	8.7	9.3	9.9
17	1,488	12.6	84.9	9.9	8.5	7.8
24	1,352	11.1	82.1	8.0	10.4	8.8
MAR. 3	1,076	9.5	88.2	13.8	10.3	6.9
10	1,362	6.5	47.7	11.1	8.5	7.3
17		5.9				
24	526	5.0	95.1	4.4	32.7	10.6
31	1,020	7.0	68.6	8.0	12.6	8.1
APR. 7	996	7.7	77.4	6.3	25.1	15.5
14	1,104	8.1	73.4	7.5	20.1	13.8
21	1,466	11.0	75.0	11.3	26.1	23.9
28	1,644	14.7	89.4	11.4	9.5	9.7
MAY 5	1,728	17.9	103.5	10.7	18.9	20.4
12		18.6				
19	1,752	20.6	117.4	11.8	7.1	7.7
26	1,626	20.6	126.5	6.1	4.9	4.9
JUNE 2	1,728	23.1	133.8	9.4	8.1	8.7
9	1,980	23.5	118.7	15.8	3.6	4.4
16	1,986	21.7	109.2	14.5	4.6	5.7
23	2,526	22.0	87.1	61.0	0.5	0.7
30	2,356	21.0	89.3	20.2	3.4	0.5
JULY 7	2,568	19.3	75.1	29.6	2.7	4.5
14	2,580	17.0	65.9	25.5	3.1	5.0
21	2,516	18.0	71.6	21.7	6.1	9.7
28	2,565	18.0	70.2	33.6	2.2	3.5

WEEK ENDING	MIXED LIQUOR S.S. (PPM)	SETTLEABLE SOLIDS %	SLUDGE VOLUME INDEX	SLUDGE AGE (DAYS)	BOD LB/ 100 LBS S.S.	BOD LB/ 1,000 CU.FT. AER. VOL/ DAY (LBS)
AUG. 4	4,840	21.5	44.4	29.6	6.2	20.1
11	2,442	21.0	86.1	24.0	6.8	10.2
18	3,082	22.7	135.2	26.0	4.0	7.7
25	2,478	21.0	84.9	18.3	4.1	6.5
SEPT. 1	2,650	22.4	84.6	19.3	5.1	8.5
8	2,788	23.0	82.5	26.0	4.5	8.0
15	2,456	18.0	73.4	16.3	5.1	7.7
22	2,547	19.0	74.6	46.5	2.5	4.0
29	2,644	20.0	75.6	18.1	5.5	9.1
OCT. 6	2,686	22.0	81.9	20.8	4.4	7.3
13	2,906	27.0	93.1	8.2	18.8	34.2
20	3,132	27.0	86.3	27.8	4.2	8.3
27	3,132	27.0	87.6	27.0	3.5	6.8
NOV. 3	2,958	27.0	91.4	32.4	3.1	5.7
10	2,684	25.0	93.1	22.8	3.8	8.7
17		21.0				
24		20.0				
DEC. 1	3,608	22.0	61.0	35.0	3.1	6.9
8	2,650	22.0	83.1	16.3	6.1	10.2
15	2,600	21.0	80.8	23.8	4.8	7.8
22	2,410	21.0	87.1	11.5	7.7	11.5

TABLE XVIIIPORT COLBORNE WATER POLLUTION CONTROL PLANT (EAST)SLUDGE DISPOSAL

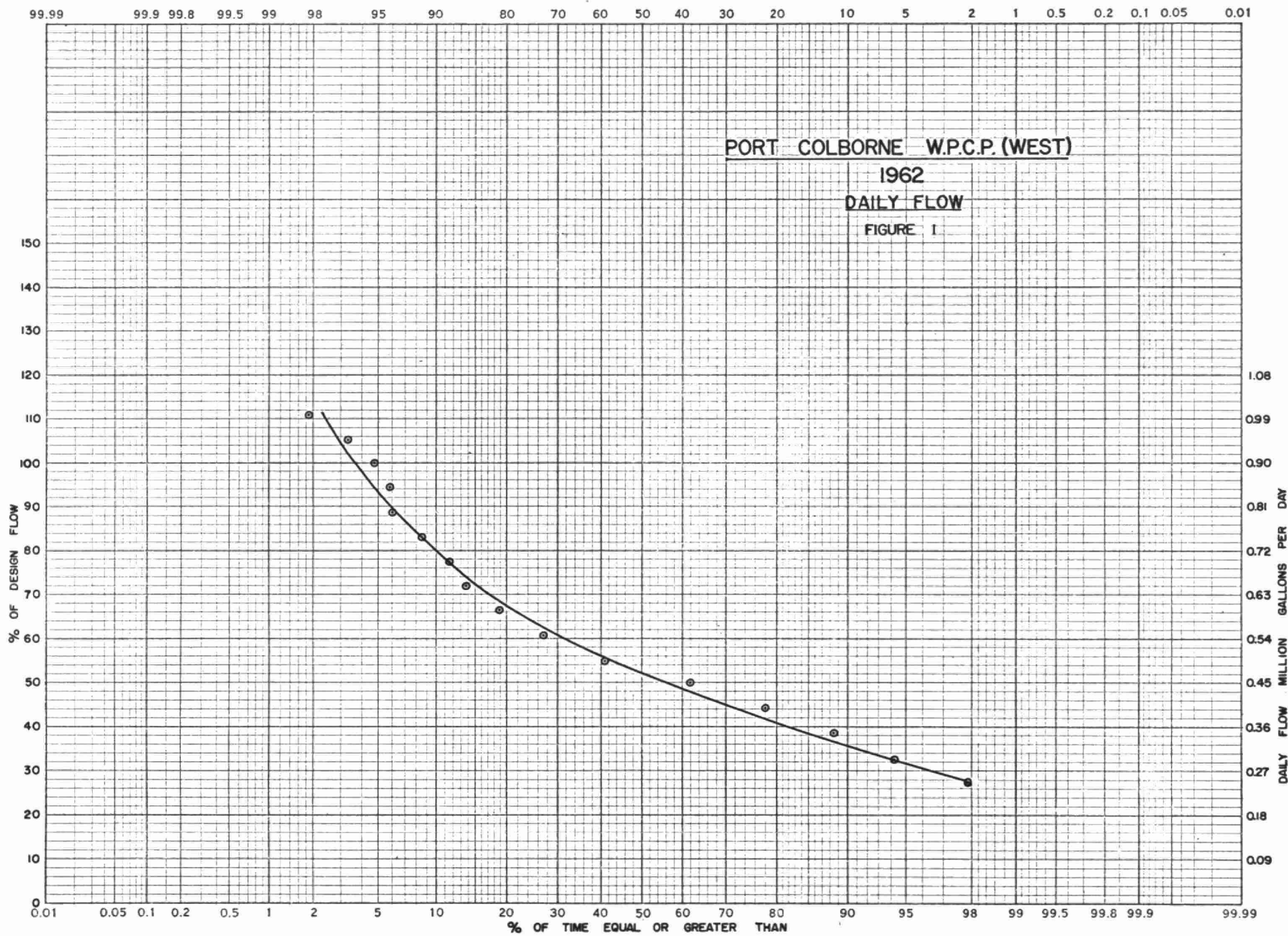
MONTH	SLUDGE TO DIGESTER (GAL)	DIGESTED SLUDGE REMOVED FROM DIGESTER (GAL)	DIGESTED SLUDGE HAULED (GAL)
JANUARY	113,500	56,250	72,000
FEBRUARY	92,000	97,500	
MARCH	58,750	66,500	42,000
APRIL	69,500	69,500	
MAY	76,500	89,750	
JUNE	67,500	70,750	
JULY	66,250	67,250	21,600
AUGUST	72,100	65,000	
SEPTEMBER	72,750	63,200	9,600
OCTOBER	82,250	92,000	44,400
NOVEMBER	89,500	70,500	37,200
DECEMBER	93,000	90,750	34,800
TOTAL	953,600	898,950	261,600

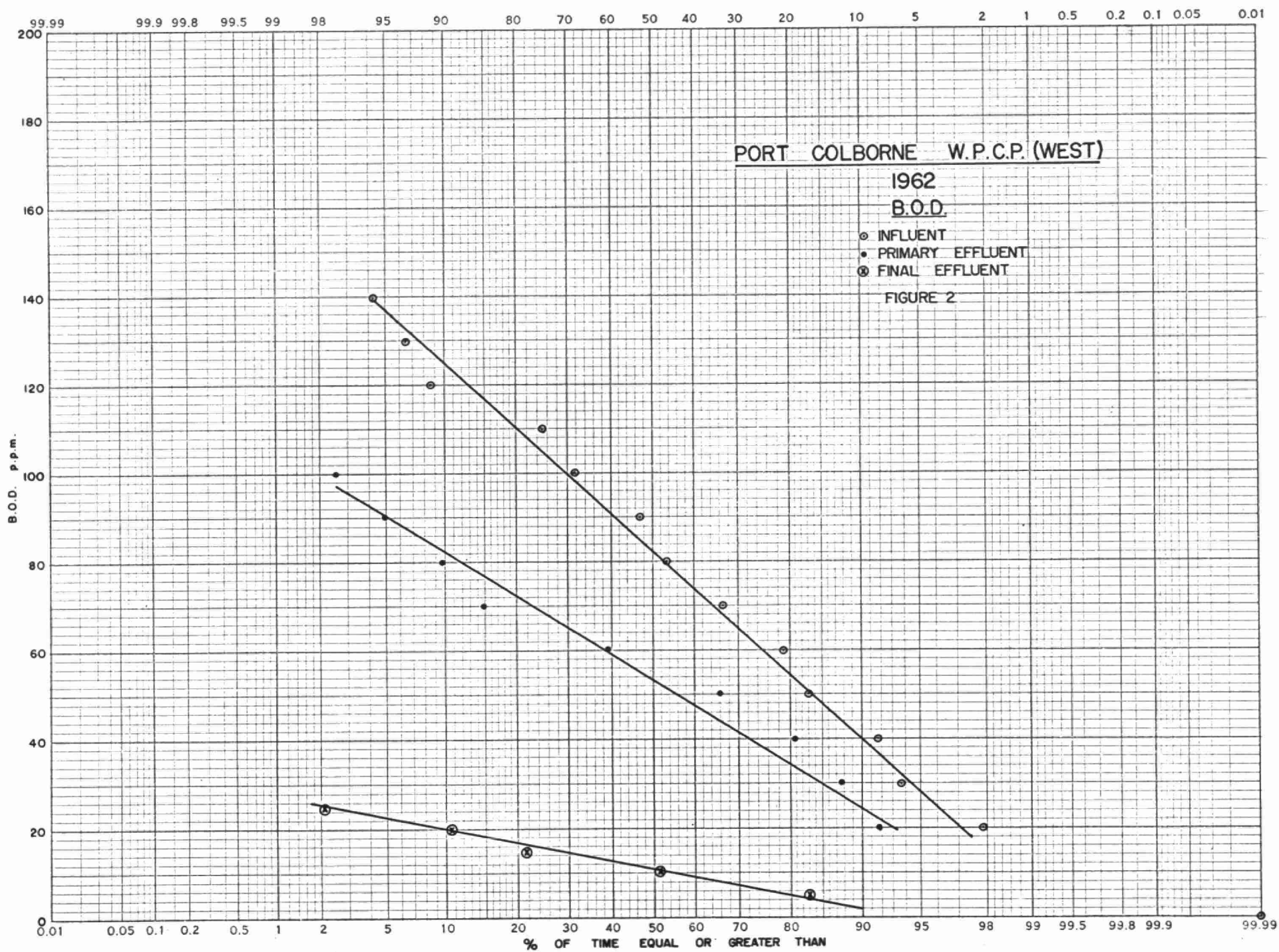
TABLE XIX

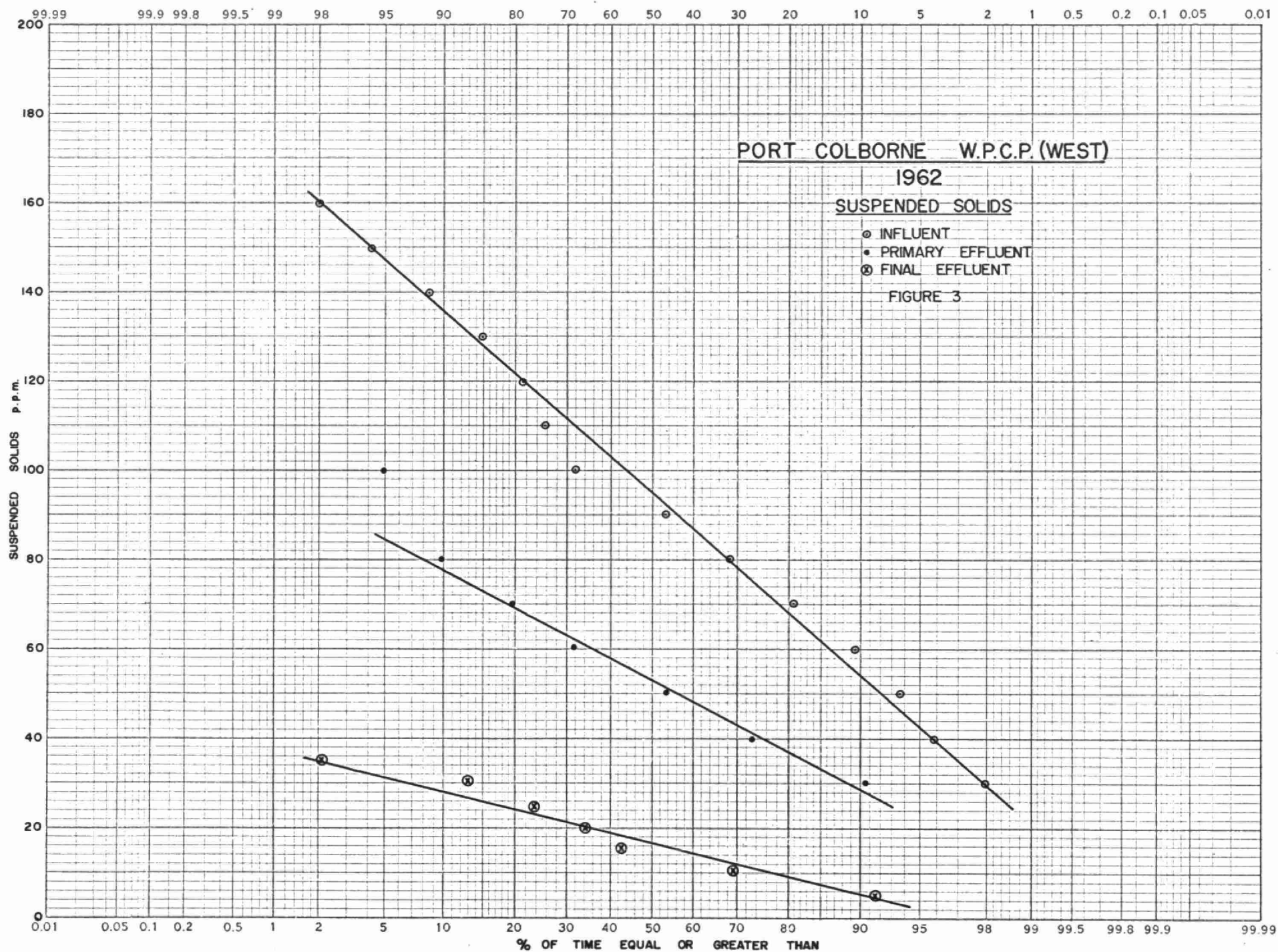
PORT COLBORNE - EXPENDITURES 1962

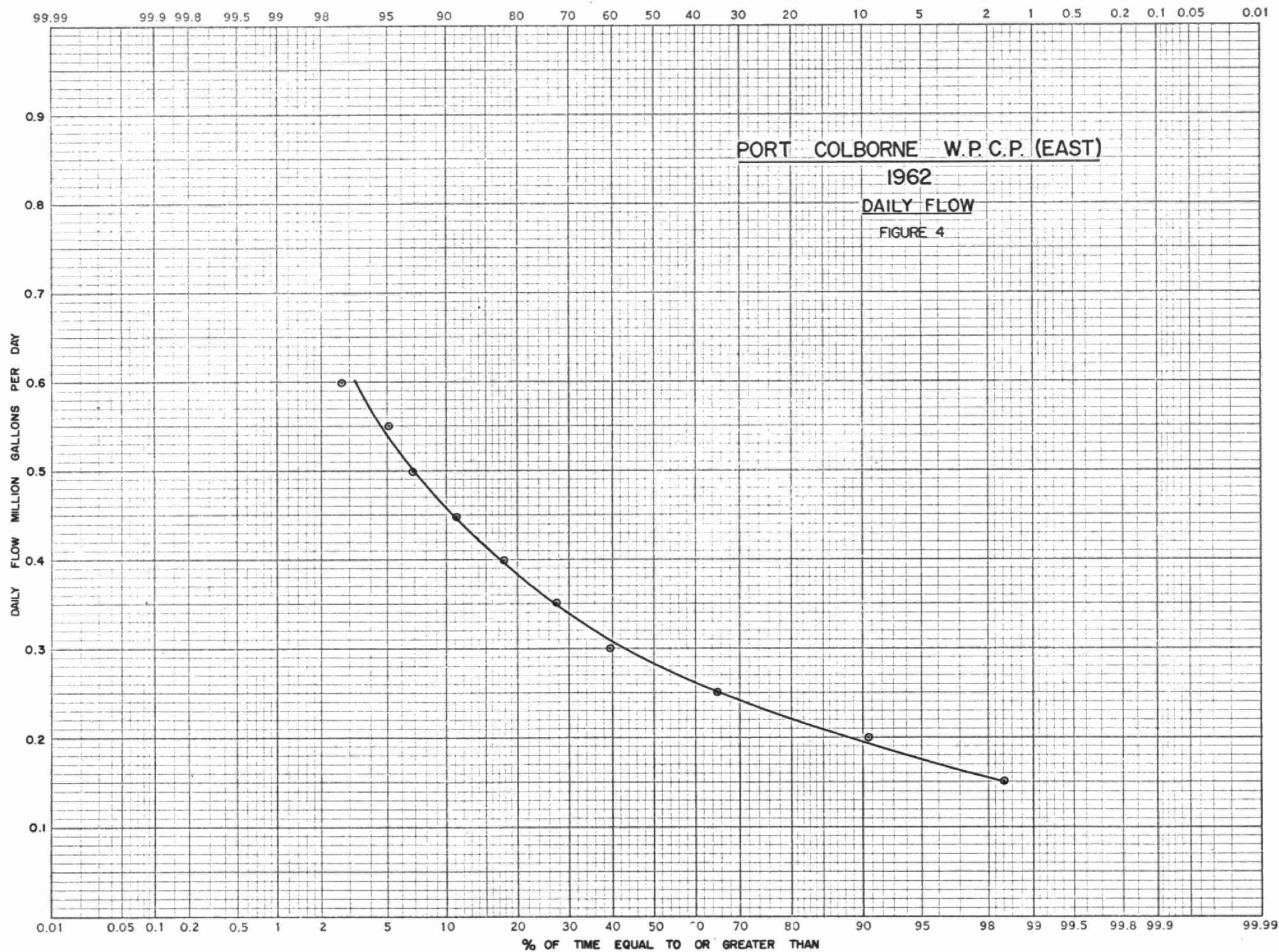
MONTH	EXPENDI- TURE	PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS AND MAINTENANCE	WATER	SUNDRY	SLUDGE HAULING
JAN.	2,755.30	2,366.05	180.94			82.32				125.99	
FEB.	4,106.25	2,259.22	485.24	681.76		153.04		180.35	172.52	118.12	56.00
MAR.	3,647.69	2,244.18	393.41	672.57	18.28	42.73				155.77	120.75
APR.	4,211.58	2,244.18	256.88	721.82	590.33	52.97	59.50			191.40	94.50
MAY	9,104.95	2,323.91	158.27	659.72		189.97		1,799.32	121.42 ^x	3852.34	
JUNE	4,251.44	2,559.46	172.47	520.82		159.05	82.48			666.16	91.00
JULY	5,109.88	2,559.46	173.12	562.30	294.65	159.58		19.18	136.09	1205.50	
AUG.	5,418.66	3,839.19	87.49	551.92	27.44	492.74	209.83	14.93		142.62	52.50
SEPT.	3,317.14	2,680.28	95.14	551.19	364.03	187.71	51.45			+612.66	
OCT.	3,718.26	2,559.46	73.88	514.02	107.06	135.08		28.00	164.76	136.00	
NOV.	4,380.99	2,562.57	182.99	553.19	324.56	264.50	168.14	23.14		184.65	117.25
DEC.	6,378.34	3,992.30	263.43	1274.56	224.03	415.98				208.04	
YEAR	56400.48	32190.26	2523.26	7263.87	1950.38	2335.67	571.40	2064.92	594.79	6373.93	532.00

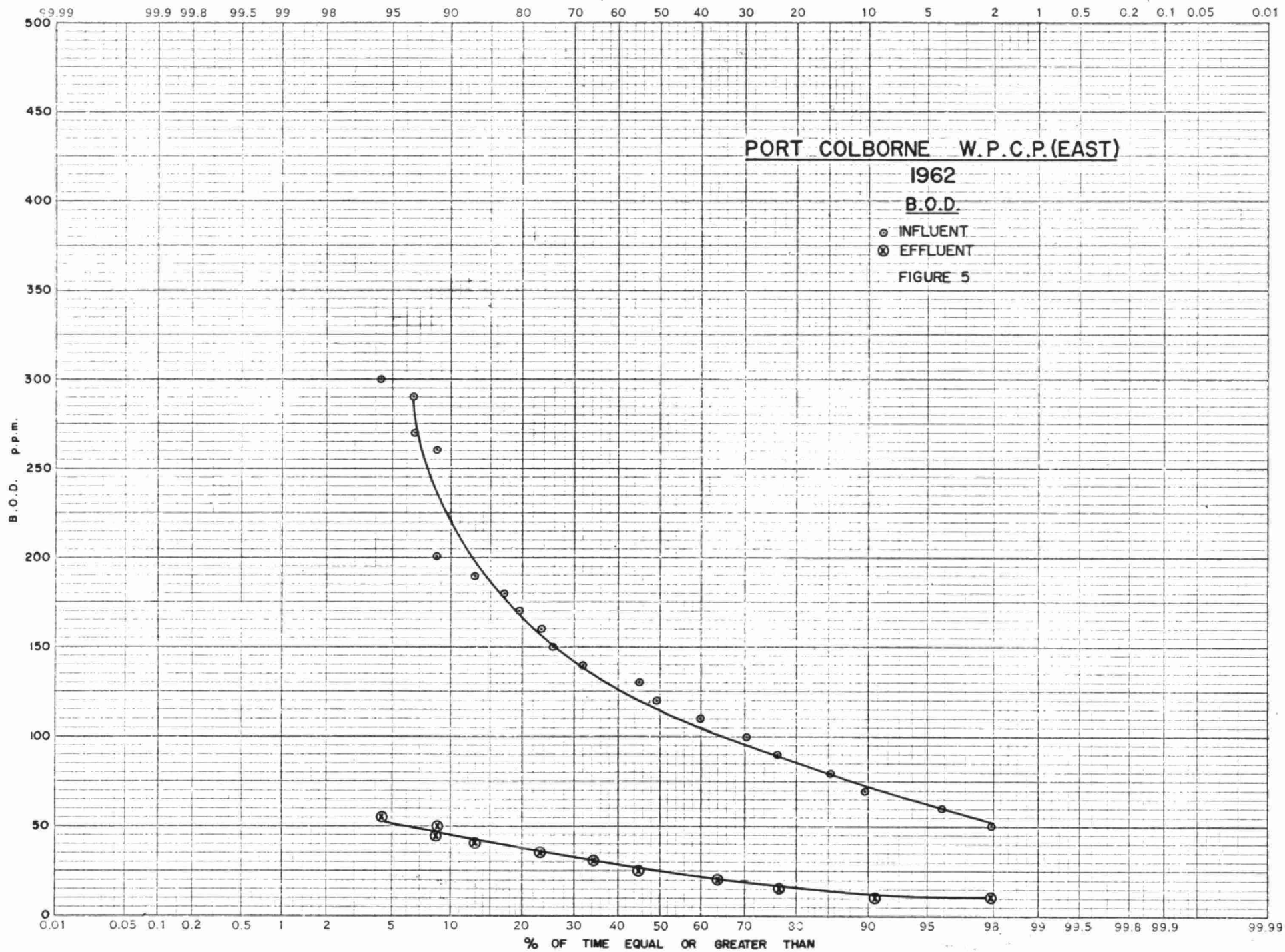
Note: + credit
x 3727.08 Taxes

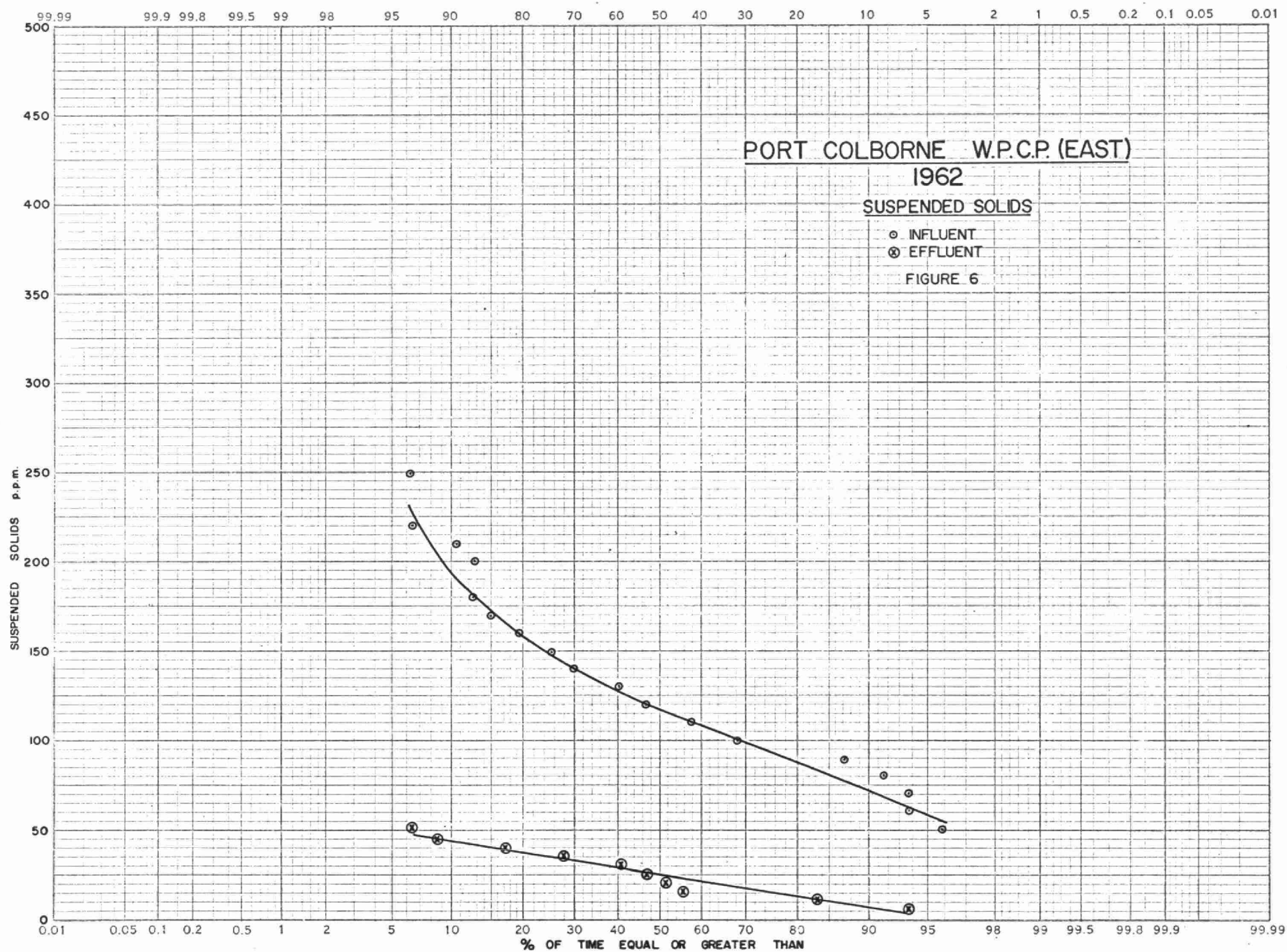












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